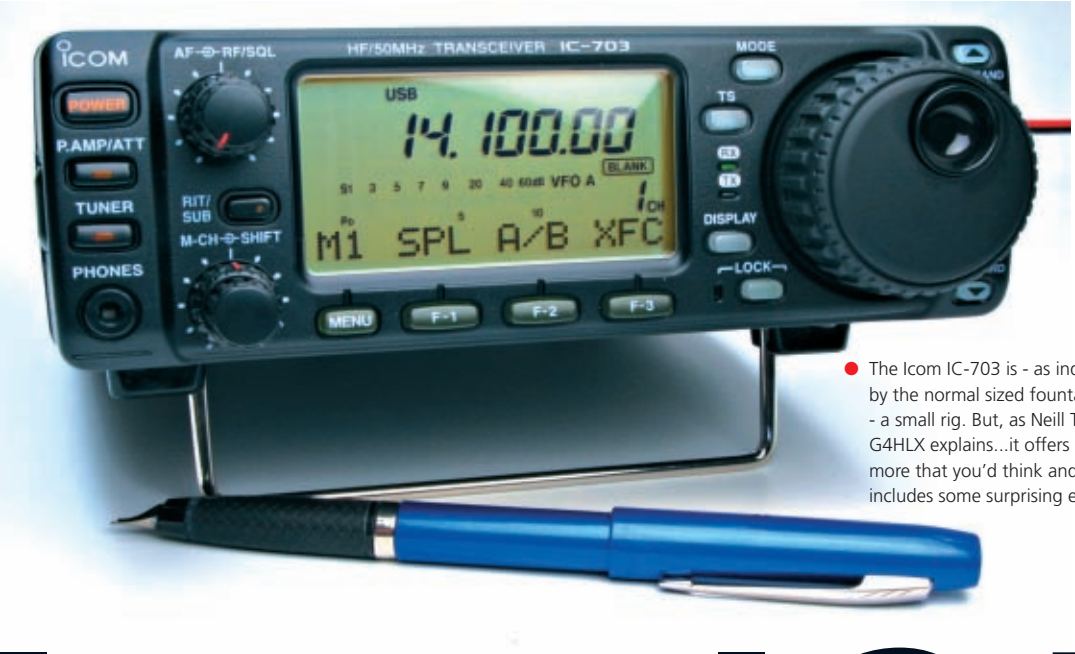
Neill Taylor G4HLX, the *PW* 144MHz QRP Contest organiser enjoys outdoor Amateur Radio. This time he's been sampling the latest offering from Icom during a picnic and portable excursion!

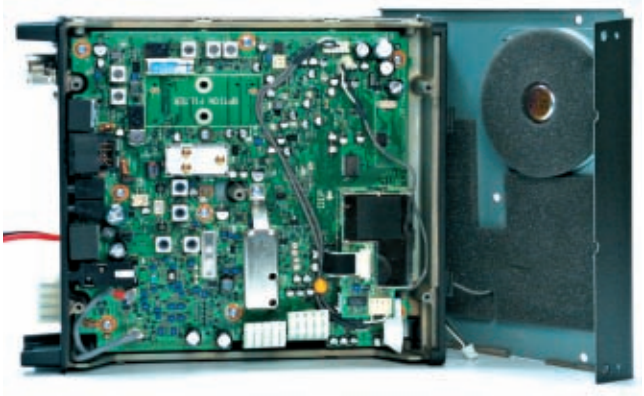


● The Icom IC-703 is - as indicated by the normal sized fountain pen - a small rig. But, as Neill Taylor G4HLX explains...it offers much more that you'd think and includes some surprising extras!

Icom IC-7

HF/50MHz Transceiver

The latest addition to the growing range of small h.f. transceivers is the little IC-703 from Icom. The transceiver is **'little'** in the sense that it's lightweight, low power and physically quite small, as well as being comparatively low cost. However, as I found out on the air, the IC-703 is certainly not a little rig when it comes to features, and holds up pretty well against 'the big boys' in transmit and receive performance!



● An inside view of the IC-703 transciever.

The IC-703 easily-portable transceiver is bound to look attractive to those who like to take their Amateur Radio beyond the shack and the car. In particular I think it will appeal to 'back-packers', climbing to hilltops or other exotic locations on foot. It will also find a home in the shack of a QRP enthusiast, working fine as a base station, and in particular I think it will appeal to holders of a Foundation Licence.

What's In The Box?

Right...now I'll answer the question..."What's in the box for you"?. On arrival you'll find that the IC-703, heading photograph, provides (in a box measuring about 220 x 170 x 60mm and weighing under 2kg) coverage of all h.f. bands plus 50MHz.

The transceiver has 10W transmit power output on s.s.b., c.w., f.m. or data modes, and 4W on a.m. It also includes a general coverage receiver with a tuning range from 30kHz to 60MHz.

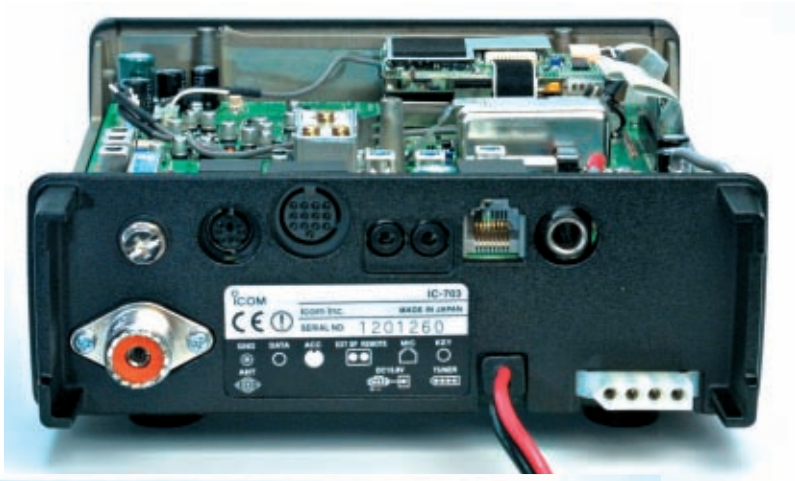
Additionally, the transceiver has a built-in auto antenna tuning unit (a.a.t.u.) and digital signal processing (d.s.p.) as standard. In short, add an antenna and a power supply or battery, and you have a complete and highly portable station. The optional carry bag makes this even easier.

In appearance, the IC-703 looks very like the older and well-established IC-706 series. In fact, the front panel is entirely identical with the IC-706 MkIIG (apart from the name IC-703!).

The functionality of these two transceivers is very similar, too, with the IC-703 menu system, etc., very much like that of its older cousin. However, there's no doubt that the IC-703 has been designed with portable operation in mind!

For example, the designers have worked hard keeping current consumption low to preserve battery life. Basing its functionality on the IC-706 seems like a good idea, given how popular the '706 continues to be, some eight years after the first model was launched.

As an all-in-one low power rig



● Rear panel view onf the IC-703 (see text).

for the QRP enthusiast or Foundation Licensee, the IC-703 seems to provide everything you need. Except that is....for coverage of the 144 and 432MHz bands. This is an unfortunate omission, in my opinion, although I'm glad they managed to squeeze 50MHz into the box though.

Neill Impressed!

I was keen to try out this little transceiver on the air, and when I powered it up for the first time I was at once impressed....it didn't have a 'small rig' feel or sound. Tuning in some s.s.b. stations on 14MHz, I found the audio through the internal speaker to be full and clear.

The large tuning knob is

703

comfortable, although there are two settings of dial tension, and I would have preferred the lighter one to be slacker for more of a spin. The menu system is easy to access, and I could guess what many of the items did before delving into the manual.

The receiver does seem to have good sensitivity. On 50MHz I used it to listen to a beacon which is marginal at my QTH. Comparing the IC-703 with my other 6m band receivers I found it to have quite acceptable performance, and I would have been happy to use it for DX work on this band.

I was then ready to do some transmitting, so I thought it was time to open the manual and have a read. The description of getting started all seemed a bit long-winded, but would probably be quite helpful for an absolute newcomer.

Anyway, I soon found how to adjust the microphone gain and audio compression level for my voice (the initial settings were, in fact, just right). I also learnt how to use the automatic a.t.u. (a.a.t.u.), which was simple: **just press the button!**

I was soon enjoying a string of QSOs on 14MHz s.s.b. I was reminded, once again, that plenty can be achieved with just 10W output power, provided you're not too ambitious.

The quality of the transmitted audio sounded good to me (I recorded this on a separate receiver). I also received several complementary reports of the audio quality from the stations I worked. The speech compressor provided a worthwhile increase in signal 'punch' without degrading the quality of the sound.

Using CW

Next, turning to c.w., where the full potential of QRP is to be realised, I found the rig to be quite capable. One of the optional c.w. filters would be necessary for serious c.w. operating, though, the options being 500 or 250Hz.

The built-in iambic keyer is very easy to use, I just plugged in my paddle and away I went. Various menu settings allow the keyer to be configured for personal preference.

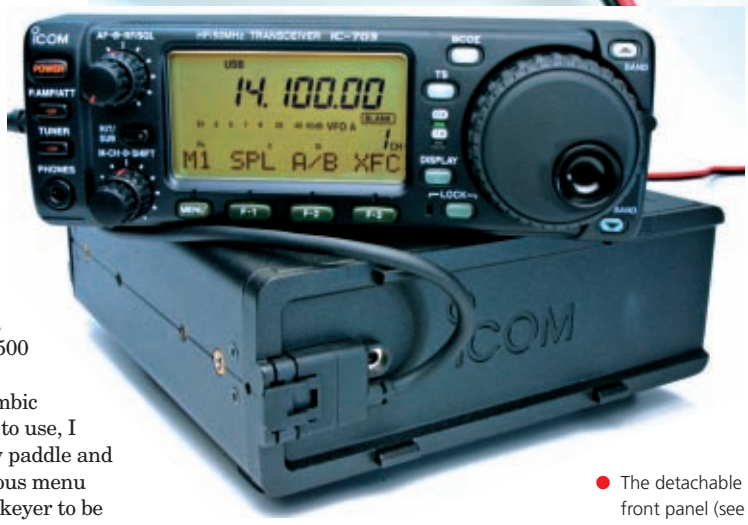
It's even possible to set it to use the **Up** and **Down** buttons on the microphone in place of a paddle key! To my surprise I found this moderately easy to use, and it would be useful in an emergency, maybe, if operating portable without a key when the need to switch from s.s.b. to c.w. arose.

Either full or semi break-in, with adjustable delay, is available. The full break-in works well, and I could 'hear between the dots' when sending at speeds up to about 20w.p.m.

However, I was surprised to find that relays are used for the transmit-receive switching. And although they're not loud, I found the constant clattering quite distracting (I suppose I wouldn't have noticed it had I been using headphones). But the semi break-in, with a short delay time, suited my operating style nicely.

The c.w. keyer also features three message memories. These are not loaded with a message using your key, but by a fairly complex operation using the menus.

Having programmed-in your three messages, it's then easy to send them with a single button press. One of the three messages can be used to send a report and contest serial number, which automatically



● The detachable main front panel (see text).

increments each time it's sent. This is all very clever, but I think it would only be useful for rather casual contest operating.

For serious contesting, automation of serial numbers, etc., is bound to be done by your logging software running on a PC. Interfacing this sort of thing with the IC-703 is enabled by its Icom standard CI-V computer interface (an optional level converter is needed to connect it to a RS-232 port on the computer).

The FM Mode

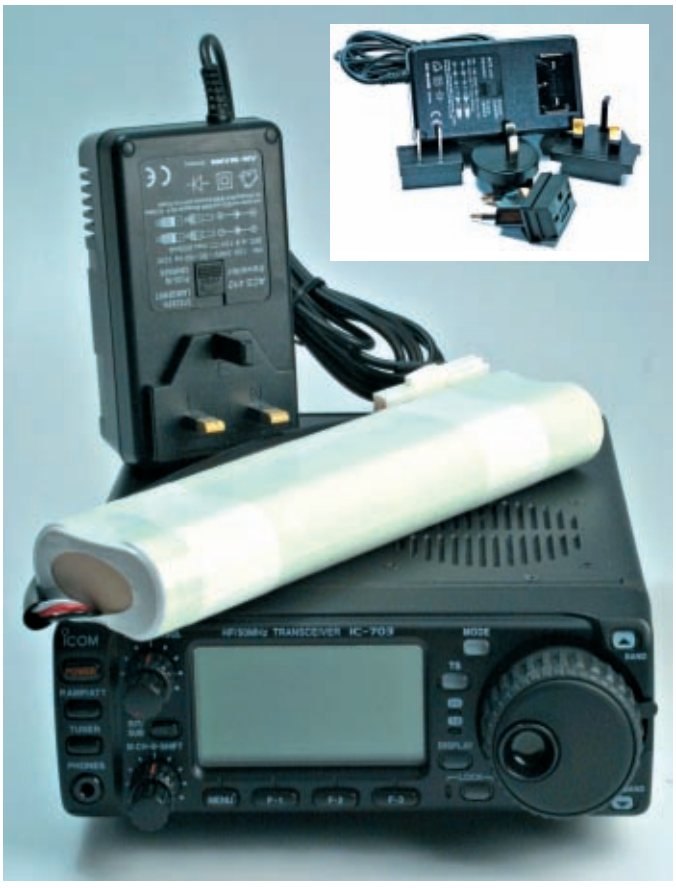
The f.m. mode, while not essential for h.f. operation, is properly supported by this transceiver. It has a CTCSS tone encoder and decoder, as used to access many v.h.f. repeaters.

The transmit frequency offset for a repeater has to be set up using the split function, and then the combination can be stored in a memory, complete with the tone frequency. It seemed a bit odd to find all this in a transceiver without 144 or 433MHz capability.

Tuning & Controls

The main tuning dial is smooth, and in s.s.b. and c.w., a 10Hz tuning step

The main battery pack (see text) and power supply...clearly proving how small the IC-703 is! The inset photograph shows the adpator units for use internationally.



is standard, although a very fine 1Hz step can be set with a single button press. Faster rates can be set according to your preference, and a menu option gives you a quarter-speed slow tuning rate.

A nice feature (which I didn't see mentioned in the manual)...is that if you spin the dial fast enough it switches to a quicker tuning rate to rapidly QSY. Band **Up/Down** buttons move sequentially through all the Amateur bands from 1.8 to 50MHz.

The buttons also select the general coverage receiver, which appears in the sequence at the appropriate position, depending on the frequency that you last left it. For example, I tuned it to one of the experimental 5MHz frequencies and when switching up through the bands 60m appeared between 3.5 and 7MHz (but of course the rig cannot transmit on 5MHz).

There are two v.f.o.s on the IC-703 with the usual ability to operate 'split' (transmitting on one and receiving on the other). Although setting up the split frequencies is easy on the IC-703, I particularly liked the 'quick-split function'.

Having previously defined a split offset via a menu setting (I chose 5kHz), the split can be set up practically instantly by pressing the **SPL** key, assuming you have the right menu showing at the time. So, if you are waiting to get through a pile-up when the DX station suddenly says "I'm going split - listening 5 up"....you can be first in the queue on his new receive frequency. (You and all the other IC-703 owners, of course!)

Memory Channels

The IC-703 has 99 memory channels, and I found them very easy to set and to use. Frequency and mode are stored, and if split operation is selected, the independent transmit and receive frequencies are stored.

There are three further pairs of memories that can be used to store scan edges. As well as v.f.o. scanning, a scan the through memory channels is easy to run, with individual channels skipped from the scan if desired. All the usual scan options are available, utilising the all-mode squelch to search for a busy channel, for example.

In addition to the 99 memories, there's also 'memo pad', in which a single button press stores the current frequency and mode in a rotating bank of five memories (it can be increased to ten via a menu setting). This is very handy when tuning the band in the 'search and pounce' mode, when you hear a station who you want to work, but who is busy or has too many callers. All you do is pop the frequency in the memo pad and come back to it later.

Portable Power

As I mentioned before, the IC-703 is predominantly a portable rig and can operate on a supply voltage between 9 and 15V. Because of this flexibility a variety of battery supplies would be suitable.

Icom offer a 9.6V 2.8AH NiCad pack as an option, and I found this to be effective. I didn't operate long enough to flatten this battery between charges, but I would expect a few hours operation to be possible at normal transmit/receive time ratios.

When the rig detects that its supply voltage is 9.6V, or anything below about 11V in fact, a range of power-saving features switch in automatically. The maximum output power drops to 5W and the backlight of the main l.c.d. display switches off when no control has been touched for a few seconds.

Other power saving features can be selected by the menus, including a **Power Saver** when you're receiving with the squelch enabled (it's similar to this kind of function found in v.h.f. hand-helds).

When operating from a 9.6V supply, I measured the current consumption to be about 300mA when receiving a signal at a comfortable audio level, and 1.7A for 5W continuous power output (rather less on average in s.s.b. use, of course).

In fact, the figures I've quoted are quite low compared with many amp-guzzling radios. This suggests that considerable design effort has gone into optimising the IC-703 for battery use.

Unexpected Extras

Now on to some of the 'extras' that are featured in this transceiver which you might not expect in a basic modestly-priced rig. And I'll start with the i.f. shift control.

The control enables the i.f. pass band to be moved up and down in frequency when s.s.b. or c.w. modes are used. This can be useful to avoid problems from strong signals on adjacent frequencies. In c.w. use, since I didn't have one of the optional narrow filters, I found this shift control very useful to eliminate other c.w. signals nearby the one I was listening to.

The other 'extra' - the DSP - provides just two functions: On s.s.b. an automatic notch filter can easily be enabled that searches for constant tones and notches them out. Thus heterodynes from extraneous sources can be eliminated, and I found that it works well.

When you're using s.s.b. or c.w., the DSP noise reduction can be switched in. This removes much of the noise content of the audio signal, and certainly provides a marked change to the quality of the sound.

In use...with many s.s.b. signals of modest strength (when there's a significant background noise level) I found the facility definitely makes the speech sound as though it has better fidelity. But whether or not it made it more intelligible...I'm not sure. I found many signals that the noise reduction made 'nicer' to listen to, but despite trying hard...I couldn't find any signal that became readable with the noise reduction, but unreadable without it.

Another 'extra'...the a.a.t.u. is **a very useful device** to have built in to the rig, especially for portable use when it's necessary to sling up a temporary antenna. But remember...it's not designed to match a very wide range of impedances, so you can't just plug in a random length wire and expect to get a match on all bands.

However, although Icom offer an optional external a.a.t.u. with a wide range capability, the internal one is specified as being able to match loads up to a v.s.w.r. of 3:1 (a little less on 50MHz). And to see what this means in practice, I first put up a dipole cut for 14MHz.

The a.a.t.u. easily matched the antenna not only on 14MHz, but also on 7, 18 and 21MHz too! Of course, just because a match is achieved doesn't mean that power is effectively coupled to the antenna, nor that the antenna is efficient. But it's a start. Next I tried the a.a.t.u. on my dipole cut for 7MHz. To my surprise it could match this on all nine bands 1.8 to 28MHz.

Data Modes

Data modes are well provided for, although I was not able to test these functions in the time available. The RTTY mode seems well thought out and it should be easy to connect to a terminal unit.

I was surprised to find the facility for connecting a TNC for packet operation at not only 1200 baud...but also 9600 baud, the bandwidth of which must surely be out of the question on the h.f. bands. (Perhaps it's intended for operation with a transverter for v.h.f. or u.h.f., although this would seem to go quite against the all-in-one nature of the IC-703).

The carry-bag, which is shown modelled by Katherine 2E1HFX in true back-packing style. The remote front panel is accessible in its own pouch attached to the waist strap (see text).

Instruction Manual

The instruction manual provided with the transceiver is far from optimum, in my opinion. There's a lot of repetition, and finding out about the operation of a specific function can take a lot of searching. There is no index, which would have helped to resolve this.

However, the most serious fault is that the manual contains a number of errors. Different modes of operating are covered in sections such as 'Operating FM', under which all the main features for this mode are explained. But, for example, on this page it lists "convenient functions for receive" including i.f. shift, noise reduction and auto notch filter. But in fact...none of these are available when operating f.m., as is made quite clear elsewhere in the manual!

On almost every mode covered, there's a description of one or more features that are not actually available in that mode.

Another way of using the IC-703 in its optional carrying bag, which also holds the battery pack. Ideal for picnic-style operation!

The exception is s.s.b., where the list seems accurate.

An experienced operator will not be bothered by the manual errors, but it seems to me that since the IC-703 is likely to appeal particularly to newcomers with Foundation Licences, it is regrettable that these mistakes have been made.

Much Admired Bag!

Finally, I have to admit to being most surprised at how much I admired one of the optional accessories for the IC-703...the carrying bag! It's an extremely well thought-out backpack-style bag (see photos), which can hold the rig, battery and accessories, with space for log book, fasteners for antenna poles, etc.

The carry-bag seems tough and is comfortable to wear. A separate small pouch is provided for the removable front panel of the transceiver. This, in common with some mobile rigs, can control the transceiver remotely at the end of an extension cable (another optional extra).

The pouch fixes to the waist belt, so the rig can be operated while in the bag on your back when (for example) in use with a whip antenna. And...if it starts to rain a pocket on the top of the bag can be opened to pull out a waterproof cover which slips over the entire carrying bag.

The instructions that came with the bag include some rather odd translations from the Japanese! And the authors don't confine themselves to explaining how to use the bag...but also touch on some more fundamental aspects of portable operation.

One sentence was most amusing, and it's my favourite! It says...*"When operating condition is no good, changing operating place may help clear operation"*. Profoundly true, if I've understood it correctly!

The thought that has gone into the design of the bag confirms my view that the IC-703 is intended primarily as a portable rig. The fact that the transceiver provides features that are valuable in a base station, and gives a respectable transmit and receive performance as well, is a bonus.

The omission of v.h.f./u.h.f. capability, while understandable in a rig of this size, is the only aspect that may lead a new Foundation Licence holder to consider the alternatives. However, as a complete all-in-one portable h.f./50MHz rig, the IC-703 has a lot to recommend it. *PW*

Icom UK reply to comments on the IC-703 made by Neill Taylor G4HLX

Dear *PW* - Thanks for the positive and thorough review of our latest rig and the opportunity to respond to some of the issues raised in the review.

The reviewer states that there is no index in the handbook. We would like to point out that there is a comprehensive Table of Contents section which clearly guides the user to specific areas of the manual. Regarding the section 'Convenient Functions to Receive'. We realise that the inclusion of this in each operating section is a quirk of our Japanese cousins. The only thing that is misleading is the reference to i.f. shift. We will point this out to Icom Inc. and hopefully this will be removed from future versions of the manual.

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Company

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Pros and Cons

Pros: *....."when I powered it up for the first time I was at once impressed....it didn't have a 'small rig' feel or sound....."as a complete all-in-one portable h.f./50MHz rig, the IC-703 has a lot to recommend it.....I have to admit to being most surprised at how much I admired one of the optional accessories for the IC-703...the carrying bag! It's an extremely well thought-out backpack-style bag*

Cons *...."the manual contains a number of errors....". "The omission of v.h.f./u.h.f. capability, while understandable in a rig of this size, is the only aspect that may lead a new Foundation Licence holder to consider the alternatives".*

Price

IC-703 £703.53
LC156 Carry case £62.06
BP228 Battery pack £71.76
Charger for Battery pack £67.00 approx
all prices include VAT

Summary

"The IC-703 easily-portable transceiver is bound to look attractive to those who like to take their Amateur Radio beyond the shack and the car.....it will also find a home in the shack of a QRP enthusiast".

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